

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A mirror assembly security system for a vehicle comprising:  
an exterior mirror assembly including a reflective element, a casing for said reflective element, including means defining a mounting surface and a cooperating member associated with said mounting surface;  
5 a light module positioned in said assembly, said light module for projecting light from said assembly on an area in order to create a lighted security zone in the area; and  
said light module including an enclosure, a light-transmitting opening in said enclosure, a light source supported in said enclosure for radiating light through said light-transmitting opening, and a cover for said light-transmitting opening, and a positioning member interacting  
10 with said cooperating member in order to orient said enclosure at a given orientation with respect to said mounting surface.
2. The mirror assembly security system in claim 1, said enclosure including a reflective surface, said reflective surface directing at least a portion of light radiating from said light source through said light-transmitting opening.
3. The mirror assembly security system in claim 2, said reflective surface at least partially surrounding said light source in said enclosure.
4. The mirror assembly security system in claim 1 wherein said reflective surface directs light from said light source in a direction generally downwardly and rearwardly of the vehicle.
5. The mirror assembly security system in claim 1, wherein said enclosure includes a reflective member having a reflective surface, said reflective member having portions straddling said light source.

6. The mirror assembly security system in claim 5, wherein said enclosure includes first and second opposed side walls and first and second electrical contacts, said first contact disposed on said first side wall, said second contact disposed on said second side wall and said contacts supporting said light source and for electrically coupling said light source to the external power supply.

7. The mirror assembly security system in claim 6, said contacts extending through said enclosure for coupling to an external power supply.

8. The mirror assembly security system in claim 7, wherein said contacts are insert molded with said enclosure.

9. The mirror assembly security system in claim 7, wherein said contacts comprise brass stampings.

10. The mirror assembly security system in claim 7, wherein at least a portion of said contacts are integral with said first and second side walls.

11. The mirror assembly security system in claim 7, wherein said side walls are flexible and adapted to deflect to permit insertion of said light source between said side walls and are generally rigid when said cover is installed on said enclosure so that said light source is rigidly supported in said enclosure between portions of said contacts when said cover is installed.

12. The mirror assembly security system in claim 11, wherein said light source radiates light from a longitudinal extent, said longitudinal extent extending between said side walls.

13. The mirror assembly security system in claim 12, said reflective surface at least partially extending between said side walls, said reflective surface partially surrounding said light source to direct light radiating from said light source toward said light-transmitting opening.

14. The mirror assembly security system in claim 1, wherein said cover is an optical lens.
15. The mirror assembly security system in claim 14, wherein said lens comprises a Fresnel lens.
16. The mirror assembly security system in claim 14, wherein said lens is selected from the group consisting of a diffusive optic lens, a diffractive optic lens, a refractive optic lens, a reflective optic lens, a holographic optic lens, a binary optic lens, a clear optic lens, and a sinusoidal optic lens.
17. The mirror assembly security system in claim 16, wherein said lens is a clear optic lens.
18. The mirror assembly security system in claim 1, said enclosure having a central axis of orientation generally parallel to the direction of light transmitted from said light module and including a cylindrical wall extending around said axis of orientation.
19. The mirror assembly security system in claim 18, said light source having an elongated extent and emitting light radially from a portion of said elongated extent, said elongated extent extending between portions of said cylindrical wall.
20. The mirror assembly security system in claim 19, said enclosure including a reflective surface extending between said cylindrical wall, said reflective surface surrounding a portion of said light source so that light radiating from a rearward side of said light source is directed through said light-transmitting opening rearwardly of the vehicle.
21. The mirror assembly security system in claim 20, wherein said enclosure includes first and second contacts, said contacts disposed on opposed sides of said cylindrical wall to support

said light source and adapted for electrically coupling said light source to an external power supply.

22. The mirror assembly security system in claim 21, wherein:

each of said contacts include a support arm and a connection arm, said connection arms extending through said enclosure and projecting outwardly from said enclosure for connecting to the external power supply; and

5        said light source includes frusto-conical contacts on opposed ends of said elongated extent, said contacts supported by said support arms of said contacts.

23. The mirror assembly security system in claim 20, wherein said reflective surface is supported on said inner surface of said enclosure.

24. The mirror assembly security system in claim 20, said housing of said exterior mirror assembly having a housing wall defining said mounting surface, said enclosure adapted for mounting in said housing wall.

25. The mirror assembly security system in claim 24, wherein said cover and cylindrical wall are adapted to mount said light module in said housing wall.

26. The mirror assembly security system in claim 2, wherein said reflective surface is aluminum.

27. The mirror assembly security system in claim 1, wherein said module is a unitary assembly adapted to be substantially moisture impervious.

28. The mirror assembly security system in claim 27, wherein said cover is sealingly fixed to said enclosure.

29. The mirror assembly security system in claim 27, wherein said cover is welded to said enclosure.

30. The mirror assembly security system in claim 27, wherein said cover is fixed to said enclosure with adhesive.

31. The mirror assembly security system in claim 1, including an adhesive vent patch covering said vent aperture to permit discharge of moisture from the enclosure but to block moisture from entering said enclosure.

32. The mirror assembly security system in claim 31, said vent patch comprising Gortex<sup>7</sup> material.

33. The mirror assembly security system in claim 1, wherein said module is positioned in said exterior mirror assembly housing for directing the light radiating through said light-transmitting opening of said module in a direction generally downwardly with respect to the vehicle.

34. The mirror assembly security system in claim 1, wherein said light source is selected from the group of an incandescent lamp, a halogen lamp, at least one light-emitting diode, a vacuum fluorescent lamp, and a light pipe connectable between a light source in said vehicle and said enclosure.

35. The mirror assembly security system in claim 1, wherein said positioning member comprises a key structure and said cooperating member comprises a key way.

36. The mirror assembly security system in claim 1, further comprising another exterior mirror assembly for mounting on an opposed side of the vehicle from said exterior mirror assembly, said another exterior mirror assembly including another reflective about another housing for said another reflective element including means defining another mounting surface

5 and another cooperating member associated with said another mounting surface, said another exterior mirror assembly further including another said light module having another enclosure and another positioning member, a mating with said another cooperating member cooperating in order to orient said another enclosure at another given orientation with respect to said another mounting surface.

37. The mirror assembly security system in claim 36, wherein said given orientation and said another given orientation are in the range of approximately 30 degrees to approximately 60 degrees apart.

38. The mirror assembly security system in claim 37, wherein said given orientation and said another given orientation are approximately 30 degrees apart.

39. A light module for positioning in an opening in an exterior mirror assembly of a vehicle, the exterior mirror assembly having a casing and a retaining structure located within said casing, said light module comprising:

enclosure having an enclosure wall defining an inner surface;

5 a pair of electrical contacts disposed on said inner surface of said enclosure wall, said contacts adapted for coupling to an external power supply;

a light-transmitting opening in said enclosure;

a cover extending over said light-transmitting opening for sealing said enclosure for transmitting light from a light source in said enclosure to an area adjacent the vehicle;

10 a light source supported by and coupled to said contacts in said enclosure, said light source radiating light toward said light-transmitting opening and through said cover;

said enclosure adapted for mounting in the opening of the exterior mirror housing; and

said enclosure wall and portions of said contacts on said enclosure wall are flexible and are adapted to deflect prior to installation of said cover to permit insertion of said light source

15 between said enclosure wall, said cover adding rigidity to said enclosure wall when installed on

said enclosure so that said light source is rigidly supported in said enclosure between said contacts when said cover is installed.

40. The light module according to claim 39, further comprising a light-directing surface provided in said enclosure for directing light from said light source toward said light-transmitting opening.

41. The light module according to claim 40, wherein said light-directing surface is vacuum-metalized on to a surface of a plastic member supported on said inner surface of said enclosure.

42. The light module according to claim 39, wherein said contacts are at least partially integrally molded with said enclosure wall.

43. The light module according to claim 39, said enclosure wall defines a dome-shaped body having opposed ends walls and a side wall extending between said end walls, portions of said contacts disposed on said end walls.

44. The light module according to claim 39, said light source including an elongated light-directing surface, said elongated light radiating surface extending substantially between said end walls of said enclosure.

45. The light module according to claim 44, said light-directing surface disposed on said side wall of said enclosure, said light directing surface extending substantially between said end walls for directing the light from said elongated light radiating surface toward said light-transmitting opening.

46. The light module in claim 39, wherein:

each of said contacts includes a support arm and a connection arm, said connection arms extending through said enclosure and projecting outwardly from said enclosure for coupling to an external power supply; and

- 5        said light source includes frusto-conical contacts on opposed ends of said elongated radiating surface, said contacts supported in said support arms of said contacts.

47.     The light module in claim 46, wherein said support arms each include a receiving structure, said frusto-conical contacts extending in said receiving structure for support therein.

48.     The light module in claim 39, wherein said enclosure and said cover define a unitary module which is adapted to be substantially moisture impervious.

49.     The light module in claim 48, wherein said cover is welded to said enclosure, thereby sealing said enclosure.

50.     The light module in claim 48, wherein said cover is fixed to said enclosure with adhesive, thereby sealing said enclosure.

51.     The light module in claim 48, said enclosure including an vent aperture defining an airflow path through said enclosure in order to dissipate heat from said light source.

52.     The light module in claim 51, said vent aperture including an adhesive vent patch covering said vent aperture to permit discharge of moisture from the enclosure but to block moisture from entering said enclosure.

53.     The light module in claim 52, said vent patch comprising Gortex material.

54.     The light module in claim 53, wherein said enclosure is made from a heat-resistant polymer.



55. The light module in claim 54, wherein said enclosure is selected from the group consisting of polycarbonate, polyester, nylon, and ABS.

56. The light module in claim 54, wherein said enclosure is nylon.

57. The light module in claim 39, wherein said cover is polycarbonate.

58. The light module in claim 39, wherein said cover is an optical lens.

59. The light module in claim 58, wherein said lens is selected from the group consisting of a diffusive optic lens, a diffractive optic lens, a refractive optic lens, a reflective optic lens, a holographic optic lens, a binary optic lens, a clear optic lens, a Fresnel lens, a micro-Fresnel lens, and a sinusoidal optic lens.

60. The light module in claim 59, wherein said lens is a clear optic.

61. The light module in claim 58, wherein said light source is one of a vacuum or gas filled incandescent lamp, a halogen lamp, at least one light-emitting diode, a vacuum fluorescent lamp, and a light pipe connectable between a light source in the vehicle and said enclosure.

62. A security light module for an exterior mirror assembly for a vehicle, the exterior mirror assembly including a mirror case and a reflective element supported in the mirror case, said security module comprising:

5 a housing defining an compartment, said housing having a unitary body including a side wall and a light emitting opening in communication with said compartment, said compartment defining a central axis;

a light source having an elongated radiating surface, said light source mounted in said compartment approximately on said central axis;

a reflective surface at least partially straddling said light source;  
10 a cover sealing said compartment and adapted to transmit light from said light source,  
wherein at least one of said reflective surface and said cover direct light from said light source in  
a direction angled with respect to said central axis.

63. The security light module according to Claim 62, wherein said housing includes an inner  
surface and a plastic member supported on said inner surface, said plastic member including a  
reflective surface.

64. The security light module according to Claim 63, wherein said reflective surface is  
metalized onto said plastic member.

65. The security light module according to Claim 64, wherein said reflective surface is  
vacuum metalized aluminum.

66. The security module in Claim 62, wherein said reflective surface comprises a surface of a  
reflective member, said reflective member having a domed, saddle-shaped body with opposed  
wall portions, said opposed wall portions straddling said elongated light radiating surface of said  
light source.

67. The security module in Claim 66, wherein said wall portions of said reflective member  
have unequal lengths, whereby said reflective member directs a greater amount of light  
rearwardly of the vehicle.

68. The security light module in Claim 66, wherein said side wall includes first and second  
opposed end walls and a back wall extending between said end walls, a first lamp supporting  
electrical contact is supported on said first end wall, a second lamp supporting electrical contact  
is supported on said second end wall, said elongated light radiating surface extending between  
5 said opposed side walls.

69. The security light module in Claim 68, said contacts extending along said end walls to support said light source adjacent said reflective member, whereby said wall portions of said reflective member are coextensive with said elongated light radiating surface of said light source.

70. The security light module according to Claim 62, wherein said housing is adapted to be substantially moisture impervious.

71. The security light module in claim 70, wherein said cover is welded to said housing, thereby sealing said compartment.

72. The security light module in claim 70, wherein said cover is fixed to said housing with adhesive, thereby sealing said compartment.

73. The security light module in claim 62, said unitary body including a vent aperture defining an airflow path through said compartment in order to discharge moisture from said compartment.

74. The security light module in claim 73, including an adhesive vent patch to cover said vent aperture for discharging moisture from said compartment and for blocking moisture from entering said compartment.

75. The security light module in claim 74, said vent patch comprising Gortex7 material.

76. The security light module according to Claim 64, wherein said housing includes a positioning member for cooperating with a structure in the exterior mirror assembly for orienting said light module in a correct installation orientation for the exterior mirror assembly.

77. The security light module according to claim 62 including fastenerless mounting means for removably mounting said housing in a mirror case.

78. A mirror assembly security system for a vehicle comprising:  
an exterior mirror assembly including a housing and a reflective element supported by said housing;

a light module positioned in said exterior mirror assembly, said light module for  
5 projecting light from said exterior mirror assembly on an area near the vehicle in order to create a lighted security zone in the area; and

said light module including an enclosure and a light source supported in said enclosure, said enclosure having a volume that is less than approximately 100 cubic centimeters, and said light module for illuminating an area with a light level in the range of approximately 10 lux to  
10 approximately 40 lux.

79. The mirror assembly security system in Claim 78, wherein said volume of said enclosure is less than approximately 70 cubic centimeters.

80. The mirror assembly security system in Claim 78, wherein said volume of said enclosure is less than approximately 50 cubic centimeters.

81. The mirror assembly security system in Claim 78, wherein said enclosure includes first and second opposed side walls and first and second electrical contacts, said first contact disposed on said first side wall, said second contact disposed on said second side wall and said contacts supporting said light source and for electrically coupling said light source to the external power  
5 supply.

82. The mirror assembly security system in claim 81, wherein said side walls are flexible and adapted to deflect to permit insertion of said light source between said side walls and are

generally rigid when said cover is installed on said enclosure so that said light source is rigidly supported in said enclosure between portions of said contacts when said cover is installed.

83. A light module for positioning in an opening in an exterior mirror assembly of a vehicle, the exterior mirror assembly having a housing and a reflective element supported in the housing, the housing including an opening, said light module comprising:

enclosure defining a compartment having an inner surface;

5 a light-transmitting opening in said enclosure;

a cover extending over said light-transmitting opening for sealing said enclosure and for transmitting light from a light source in said enclosure to an area adjacent the vehicle, said cover including at least one non-planar optic surface for directing the light in a first direction from the module for illuminating an area adjacent a first side of the vehicle;

10 a light source supported in said enclosure, said light source radiating light toward said light-transmitting opening and through said cover;

said enclosure adapted for mounting in the opening of the exterior mirror housing; and

said cover adapted to be reorientated about the enclosure to redirect the light from the module in a second direction for illuminating an area adjacent a second side of the vehicle.

84. The light module in Claim 83, said cover having a second non-planar surfaces for directing light from the light source in a direction angled with respect to said first direction.

85. The light module in Claim 84, said direction angled with respect to said first direction including a lateral direction with respect to the vehicle.

86. The light module in Claim 83, said enclosure including a reflective member, said reflective member surrounding a portion of said light source so that light radiating from said light source is directed from said module for illuminating an area generally rearwardly of the vehicle.

87. The light module in Claim 86, said reflective member including a reflective surface for directing light from said light source and from said module for illuminating an area generally downwardly of the vehicle.